# HONOURS BSC CHEMISTRY - ECOCHEMISTRY OPTION

Chemistry is a modern, dynamic and diverse field that involves investigating the substances that make up our physical world and how they change. Chemistry touches everything we come into contact with. It is connected to almost all areas of science and engineering. For example, chemists play a vital role in developing new drugs, understanding and modifying biological processes and making materials for advanced electronic devices. Chemists are also important players in such diverse areas as genetic engineering, forensic science and the oil and gas industry. More recently, chemists have been at the forefront of nanotechnology and emerging green technologies, particularly in the development of sustainable energy sources.

The Department of Chemistry and Biomolecular Sciences at the Faculty of Science offers chemistry, biochemistry and biopharmaceutical science programs with unique options in medicinal chemistry, genomics, advanced materials chemistry, ecochemistry and chemical biology. In addition to classroom teaching, programs offer practical laboratory training with a focus on individual instruction.

This program is offered in English and in French.

## Program Requirements

Co-operative education is available with this program.

The French immersion stream is available with this program.

Requirements for this program have been modified. Please consult the 2025-2026 calendars (https://catalogue.uottawa.ca/en/archives/) for the previous requirements.

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|---|---|---|
| **Compulsory courses at the 1000 level** | | |
| BIO 1131 | Introduction to Organismal Biology | 3 Units |
| BIO 1150 | BioZoo: An Introduction Laboratory in Biology | 3 Units |
| CHM 1311 | Principles of Chemistry | 3 Units |
| CHM 1321 | Organic Chemistry I | 3 Units |
| GEO 1115 | Introduction to Earth Materials | 3 Units |
| One option from the following: | | 6 Units |
| **Option 1:** | | |
| MAT 1320 | Calculus I | |
| MAT 1322 | Calculus II | |
| **Option 2:** | | |
| MAT 1330 | Calculus for the Life Sciences I | |
| MAT 1332 | Calculus for the Life Sciences II | |
| One option from the following: | | 6 Units |
| **Option 1:** | | |
| PHY 1121 | Fundamentals of Physics I | |
| PHY 1122 | Fundamentals of Physics II | |
| **Option 2:** | | |
| PHY 1321 | Principles of Physics I | |
| PHY 1322 | Principles of Physics II | |
| **Compulsory courses at the 2000 level** | | |
| BIO 2129 | Ecology | 3 Units |
| CHM 2120 | Organic Chemistry II | 3 Units |
| CHM 2123 | Laboratory of Organic Chemistry II | 3 Units |
| CHM 2131 | Chemical Thermodynamics of Gases and Solutions | 3 Units |
| CHM 2313 | Environmental Chemistry | 3 Units |
| CHM 2330 | Physical Chemistry: Introduction to the Molecular Properties of Matter | 3 Units |
| CHM 2353 | Descriptive Inorganic Chemistry | 3 Units |
| CHM 2354 | Analytical Chemistry | 3 Units |
| **Compulsory courses at the 3000 level** | | |
| CHM 3120 | Intermediate Organic Chemistry | 3 Units |
| CHM 3122 | Applications of Spectroscopy in Chemistry | 3 Units |
| CHM 3128 | Catalysis and Sustainable Chemical Manufacturing | 3 Units |
| CHM 3350 | Transition Metal Chemistry | 3 Units |
| **Compulsory courses at the 4000 level** | | |
| CHM 4129 | Chemistry of Sustainable Energy | 3 Units |
| CHM 4354 | Principles of Instrumental Analysis | 3 Units |
| One option from the following: | | 9 Units |
| **Option 1: Honours Project** | | |
| CHM 4010 | Research Project [1] | |
| **Option 2: Honours Project Co-op Option** | | |
| CHM 4016 | Research Project | |
| and 3 optional course units in chemistry (CHM) at the 3000 or 4000 level | | |
| 6 optional course units from: | | 6 Units |
| CHM 3140 | Quantum Chemistry and Molecular Modelling | |
| CHM 3373 | Molecular Spectroscopy and Statistical Mechanics | |
| CHM 4123 | Medicinal Chemistry | |
| CHM 4139 | Enzyme Chemistry and Biocatalysis | |
| CHM 4155 | Polymer and Applied Chemistry | |
| CHM 4182 | Molecular Dynamics in Chemistry | |
| CHM 4311 | Selected Topics in Inorganic Chemistry | |
| CHM 4317 | Organometallic Chemistry | |
| CHM 4325 | Advanced Organic Synthesis and Reaction Mechanisms | |
| CHM 4380 | Advanced Characterization Methods in Material Science and Catalysis | |
| CHM 4381 | Photochemistry and Photobiology | |
| 6 optional course units from the list of optional courses below | | 6 Units |
| 12 elective course units offered by the Faculty of Arts, the Faculty of Education, the Faculty of Law, the Faculty of Social Sciences or the Telfer School of Management | | 12 Units |
| 18 elective course units [2] | | 18 Units |
| **Total:** | | **120 Units** |

Note(s)

[1] Project related to Ecochemistry is strongly recommended.

[2] Although the program is well suited for future graduate work, for students intending to pursue graduate studies in chemistry, it is highly recommended to take 6 of their elective course units from the list of chemistry (CHM) courses in their area of interest at the 4000 level.

# List of Optional Courses

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|---|---|---|
| BCH 2333 | Introduction to Biochemistry | 3 Units |
| BIO 1141 | Introduction to Cell and Molecular Biology | 3 Units |
| BIO 3117 | Ecosystem Ecology | 3 Units |
| BIO 4146 | Ecotoxicology | 3 Units |
| BPS 4121 | Biosynthesis and Natural Product Derived Medicines | 3 Units |
| BPS 4123 | Phytomedicines and Natural Product Drugs | 3 Units |
| CHM 3140 | Quantum Chemistry and Molecular Modelling | 3 Units |
| CHM 3373 | Molecular Spectroscopy and Statistical Mechanics | 3 Units |
| CHM 4123 | Medicinal Chemistry | 3 Units |
| CHM 4139 | Enzyme Chemistry and Biocatalysis | 3 Units |
| CHM 4155 | Polymer and Applied Chemistry | 3 Units |
| CHM 4182 | Molecular Dynamics in Chemistry | 3 Units |
| CHM 4311 | Selected Topics in Inorganic Chemistry | 3 Units |
| CHM 4317 | Organometallic Chemistry | 3 Units |
| CHM 4325 | Advanced Organic Synthesis and Reaction Mechanisms | 3 Units |
| CHM 4380 | Advanced Characterization Methods in Material Science and Catalysis | 3 Units |
| CHM 4381 | Photochemistry and Photobiology | 3 Units |
| CVG 2132 | Fundamentals of Environmental Engineering | 3 Units |
| DVM 2105 | Introduction to International Development: Historical Perspectives | 3 Units |
| DVM 3125 | Environmental Policies, Natural Resources Management and Sustainable Development | 3 Units |
| ECO 2121 | Introduction to International Economics | 3 Units |
| ENV 1101 | Global Environmental Challenges | 3 Units |
| ENV 3101 | Legal Context of Environmental Issues | 3 Units |
| ENV 4118 | Environmental Impact Assessment [1] | 3 Units |
| EVS 1101 | Introduction to Environmental Science | 3 Units |
| GEG 1301 | The Physical Environment | 3 Units |
| GEG 3302 | Natural Resource and Environmental Management | 3 Units |
| GEG 4118 | Environmental Impact Assessment [1] | 3 Units |
| GEO 1111 | Introduction to Earth Systems | 3 Units |
| GEO 2163 | Introduction to Mineralogy | 3 Units |
| GEO 2166 | Oceanography | 3 Units |
| GEO 2307 | Environmental Geology | 3 Units |
| GEO 2334 | Quaternary Geology and Climate Change | 3 Units |
| GEO 3167 | Mineral Deposits | 3 Units |
| GEO 3342 | Introduction to Hydrogeology | 3 Units |
| GEO 3382 | Geochemistry | 3 Units |
| HIS 2129 | Technology, Society and Environment Since 1850 | 3 Units |
| POL 1102 | Politics and Globalization | 3 Units |
| SOC 4310 | Globalization and the Environment | 3 Units |
| STA 2392 | Introduction to Biostatistics | 3 Units |

[1] No more than 3 course units from ENV 4118, GEG 4118.